

CLAIMS

1. A vehicular steering apparatus, a joint apparatus for the vehicular steering apparatus, comprising:

an input shaft for transmitting rotation from a steering wheel;

an intermediate shaft including an upper intermediate shaft, a lower intermediate shaft and a buffer coupling for coupling the upper intermediate shaft and the lower intermediate shaft;

an output shaft for driving a steering mechanism on a side of a vehicle; and

universal joints for respectively coupling the input shaft and the upper intermediate shaft as well as the lower intermediate shaft and the output shaft,

characterized in that at least one of the universal joints is a constant velocity ball universal joint.

2. The vehicular steering apparatus according to Claim 1, characterized in that both of the universal joints are the constant velocity ball universal joints.

3. The vehicular steering apparatus according to Claim 1, characterized in that one of the universal joints is the constant velocity ball universal joint and another is a cross universal

joint.

4. The vehicular steering apparatus according to any one of Claim 1 through Claim 3, characterized in that an intersecting angle of the constant velocity ball universal joint is selected to be larger than an intersecting angle of the cross universal joint.

5. The vehicular steering apparatus according to any one of Claim 1 through Claim 4, characterized in that the buffer coupling is a rubber coupling using rubber as a buffer material.

6. A vehicular steering apparatus comprising:

a male joint member including a first connecting base portion in a cylindrical shape and an outer spherical face joint portion provided on an axis line of the first connecting base portion and having a spherical outer face;

a female joint member including a second connecting base portion in a cylindrical shape and an inner spherical face joint portion provided on an axis line of the second connecting base portion and having a spherical space to which the spherical outer face is fitted;

an outer ball guide groove formed at the spherical outer face of the outer spherical face joint portion;

an inner ball guide groove formed at an inner face of the

spherical space of the inner spherical face joint portion;
a torque transmitting ball guided by the outer ball guide groove and the inner ball guide groove; and
a ball retainer for retaining the torque transmitting ball, characterized in that each of the first connecting base portion and the second connecting base portion includes at least one slit reaching an inner portion of a cylinder of each thereof.

7. The vehicular steering apparatus according to Claim 6, characterized in that a pair of flanges for fastening are respectively formed on both sides of the slit of each of the first connecting base portion and the second connecting base portion,

wherein each pair of the flange is formed coaxially with fastening holes.

8. The vehicular steering apparatus according to Claim 6 or Claim 7, characterized in that a female serration is formed at an inner face of the cylinder of each of the first connecting base portion and the second connecting base portion.

9. The vehicular steering apparatus according to any one of Claim 6 through Claim 8, characterized in that an interval between a cylindrical hole of the second connecting base portion and the inner spherical face joint portion is formed with a through

hole penetrating coaxially.

10. The vehicular steering apparatus according to Claim 9, characterized in that the through hole is attached with a dust preventing cap for preventing dust and dirt from invading inside of the spherical space by passing the cylindrical hole between the cylindrical hole and the spherical space.

11. The vehicular steering apparatus according to any one of Claim 6 through Claim 10, characterized in that an interval between the male joint member and the female joint member is provided with a dust preventing boot in a cylindrical shape having a flexible fold for preventing dust and dirt from invading inside of the spherical space.